



Microclimate and human factors in the divergent ecology of *Aedes aegypti* along the Arizona, U.S./Sonora, MX border

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Abstract:

This study examined the association of human and environmental factors with the presence of *Aedes aegypti*, the vector for dengue fever and yellow fever viruses, in a desert region in the southwest United States and northwest Mexico. Sixty-eight sites were longitudinally surveyed along the United States-Mexico border in Tucson, AZ, Nogales, AZ, and Nogales, Sonora during a 3-year period. *Aedes aegypti* presence or absence at each site was measured three times per year using standard oviposition traps. Maximum and minimum temperature and relative humidity were measured hourly at each site. Field inventories were conducted to measure human housing factors potentially affecting mosquito presence, such as the use of air-conditioning and evaporative coolers, outdoor vegetation cover, and access to piped water. The results showed that *Ae. aegypti* presence was highly variable across space and time. *Aedes aegypti* presence was positively associated with highly vegetated areas. Other significant variables included microclimatic differences and access to piped water. This study demonstrates the importance of microclimate and human factors in predicting *Ae. aegypti* distribution in an arid environment.

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Resource Description

Early Warning System: ☒

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☒

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Security, Indoor Environment, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☒

resource focuses on specific type of geography

Climate Change and Human Health Literature Portal

Desert

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

General Health Impact, Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue, Yellow Fever

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Short-Term (

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content